

## CLAIMS

## WE CLAIM AS OUR INVENTION:

1. A combustor comprising:

5 a cylindrical basket having an axis;

a single main burner assembly disposed within the basket and opening into a combustion chamber;

a burner insert disposed in an annular space between the burner assembly and the basket, the insert having a face exposed to the combustion chamber and

10 perpendicular to the axis of the basket;

a plurality of passageways formed through the basket, for introducing air into the combustion chamber proximate to and downstream of the burner insert;

a fluid flow path defined between a combustion liner portion of the basket and a casing spaced radially outward from the combustion liner portion, the fluid flow path discharging air into a flow reversal region proximate an inlet of the burner assembly;

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a fuel outlet disposed in the flow reversal region.

2. The combustor of claim 1, wherein the burner insert further comprises an

20 outside diameter smaller than an inside diameter of the basket so that a gap is formed along at least a portion of a circumference of the burner insert between the burner insert and the basket.

3. The combustor of claim 1, further comprising an insert support for supporting

25 the burner insert, the insert support disposed upstream of the burner insert and protected from exposure to hot combustion products by the burner insert.

4. A combustor comprising:

a cylindrical basket having an axis;

a burner assembly disposed within the basket and separated from the basket by an annular space, the burner assembly configured to discharge a fuel/air mixture into a combustion chamber downstream of the burner assembly; and

a burner insert disposed in the annular space, the insert having a downstream face exposed to the combustion chamber and perpendicular to the axis of the basket.

5. The combustor of claim 4, further comprising:

a fluid flow path defined between at least a portion of the basket and a concentric casing spaced radially away from the basket for directing air in a direction opposite from a direction of flow of the air/fuel mixture through the burner assembly;

a flow reversal region, in fluid communication with the fluid flow path, proximate an inlet of the burner assembly for redirecting the air into the inlet of the burner assembly; and

a fuel delivery mechanism disposed in the flow reversal region.

6. The combustor of claim 5, further comprising a liner support, attached to the casing, for attaching a combustor liner to the liner support with removable fasteners.

7. The combustor of claim 6, wherein the liner support further comprises a plurality of standoff tabs to space the burner insert away from a downstream end of the liner support, the standoff tabs spaced apart and extending away from the downstream end of the liner support for allowing air to flow around a downstream end of the liner support between the standoff tabs.

8. The combustor of claim 4, further comprising an insert support for supporting the burner insert, the insert support disposed on a side of the burner insert opposed to the combustion chamber and protected from exposure to hot combustion products by the burner insert.

9. The combustor of claim 8, further comprising a passage formed through the insert support for conveying a fluid to cool the burner insert.

10. The combustor of claim 9, wherein the insert support further comprises an impingement plate defining a plenum for receiving the fluid and further comprising a plurality of holes for directing the fluid to impinge on a face of the burner insert opposed the combustion chamber.

11. The combustor of claim 4, wherein the burner insert further comprises an outside diameter smaller than an inside diameter of the basket so that an annular gap is formed at least along a portion of a circumference of the burner insert between the burner insert and the basket for allowing a fluid to flow into a downstream combustion chamber.

12. The combustor of claim 4, wherein the basket further comprises a plurality of passageways circumferentially positioned proximate to and downstream of the burner insert for allowing air to flow into the combustion chamber proximate the burner insert.

13. A gas turbine combustor comprising:  
a cylindrical basket having an axis;  
a single main burner assembly disposed within the basket; and  
a burner insert assembly disposed in an annular space between the burner assembly and the basket, the burner insert assembly further comprising a burner insert having a face perpendicular to the axis of the basket and an insert support for supporting the burner insert, the insert support protected from exposure to hot combustion products by the burner insert.

14. The burner insert assembly of claim 13, wherein the burner insert is removably attached to the insert support.

15. The burner insert assembly of claim 13, the burner insert further comprising a substantially J-shaped cross section wherein a hooked portion of the J-shaped cross section forms a circumferential mounting lip around an inside diameter of the burner insert.

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16. The burner insert assembly of claim 15, the burner support further comprising a recess circumferentially formed around an inside diameter of the burner support for receiving the circumferential mounting lip of the burner insert.

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17. The burner insert assembly of claim 13, further comprising a passage formed through the insert support for conveying a fluid flow from an upstream face of the insert support to a downstream face of the insert support.

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18. The burner insert assembly of claim 17 further comprising an impingement plate attached to the downstream face of the burner support, the impingement plate defining a plenum for receiving the fluid flow and further comprising a plurality of holes for directing the fluid flow to impinge on an upstream face of the burner insert.

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19. The burner insert assembly of claim 13, further comprising a ring seal for aligning and sealing the burner insert assembly against the burner assembly.

20. A combustor comprising:

a combustor liner;

a burner assembly associated with the liner and having an inlet;

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a fluid flow path defined between the liner and a casing spaced radially outward from the liner, the fluid flow path discharging a fluid into a flow reversal region proximate the inlet of the burner assembly; and

a fuel outlet disposed in the flow reversal region.